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21 January 2004

Date

Sigrid C.B. Sommerfeldt

Full name of translator



Signature of translator

1880 King Avenue

Boulder Colorado 80302

## **Coffee grinder as well as automatic coffee maker with same**

The invention relates to a coffee grinder with a coffee bean container divided by forming two compartments, with an output shaft at the bottom common to both compartments, with a grinding mill disposed beneath the output shaft and with a closure element for the optional closing of the output of at least one of the compartments. The invention further relates to an automatic coffee maker with a coffee grinder, comprising a coffee bean container with a bottom-side output shaft and with a grinding mill disposed beneath the output shaft.

DE 196 06 076 A1 discloses a coffee grinder comprising a coffee bean container with a bottom-side output shaft. The output shaft of the coffee bean container terminates in the input of a grinding mill. The coffee bean container itself is divided into two compartments, such that two different coffee varieties can be stored in it. In the lower region of the coffee bean container a guide cone is disposed, which serves for the lateral supply of the coffee beans into the output shaft. A part of the coffee bean container is further a closure element, which is supported rotatably and which extends through the coffee bean container. The closure element is structured in the manner of a cup open toward the bottom, at whose top side a shaft with a top-side knob is disposed. The shaft itself is supported in a tubular body extending through the coffee bean container. The closure element is partially open circumferentially. The closure element can be brought with its remaining sections in front of the lower output opening of a compartment in order to fill coffee beans optionally from the one compartment or coffee

beans from the other compartment into the output shaft and to supply them to the grinding mill. Consequently, in this prior known coffee grinder, coffee beans of different varieties can be ground without first having to empty the coffee bean container.

Although in principle the functionality of this coffee grinder is given in the described manner, disadvantages can be encountered in handling the coffee grinder. For example, beans can block a rotational movement of the closure element, such that an actuation of the closure element by turning the knob is only possible, if at all, by exerting a not inconsiderable force. Further, the structuring of the coffee bean container, and especially its cover, is restricted, since it is necessary to ensure in every case that the actuation members of the closure element - shaft and knob - are in their specified position. Consequently, the realization of a hinged lid is hardly possible.

Automatic coffee makers or fully automatic coffee makers include a coffee bean container for storing coffee beans. In such automatic coffee makers with each request for coffee, freshly ground coffee powder is used for the preparation of coffee. A grinding mill associated with the automatic coffee maker is responsible for making available the particular required quantity of coffee meal. The coffee bean container comprises a receptacle with an output shaft placed onto the input of the grinding mill. As a rule, the output shaft of the receptacle carries a guide cone, in order for the coffee beans to be laterally supplied to the grinding mill. The receptacle is open at the bottom.

The coffee bean container is secured on the housing of the automatic coffee maker by means of a coupling ring, which can be secured in position on an appropriately conceptualized counterpieces, for example in the manner of a bayonet.

The coffee bean container of such automatic coffee makers includes a container for receiving the coffee beans and a shaft disposed laterally with respect to it for supplying already ground coffee powder past the grinding mill, in order for it to be poured directly into the brewing chamber.

However, there is the wish of also having available with such automatic coffee makers a coffee bean container, in which at least two different varieties of coffee beans can be stored.

Building on this discussed prior art, the invention addresses the problem of further developing a coffee grinder as well as an automatic coffee maker equipped therewith to the extent that the disadvantages listed in connection with the coffee grinder described in the introduction are at least to the greatest possible extent avoided.

This problem is solved, for one, thereby that the closure element forms with the grinding mill a concrete unit and the coffee bean container is disposed rotatably relative to the unit formed of the closure element and the grinding mill.

According to the invention the problem related to the automatic coffee maker is solved thereby that the coffee bean container is divided by the formation of at least two compartments, with the compartments of the coffee bean container terminating in the output shaft, and that the automatic coffee maker comprises a closure element for the optional closing of the output of at least one compartment, and in which the closure element forms with the grinding mill a concrete unit and the coffee bean container is disposed rotatably relative to the unit formed of the closure element and the grinding mill.

In such a coffee grinder the closure element is basically associated with the grinding mill. For this reason the coffee bean container itself does not need to include or support movable parts for driving the closure element. The closure element is disposed on the grinding mill stationarily against a rotational movement of the coffee bean container. In contrast, the coffee bean container itself is supported rotatably relative to the grinding mill between at least two end positions. The closure element partially covers the input of the grinding mill. The particular opening of a compartment for delivering coffee beans corresponds substantially to the contour of the space left free by the closure element. Consequently, through the corresponding rotation of the coffee bean container about its axis, the output opening of a compartment with the desired coffee bean variety in each instance can be brought into a disposition flush with the space not covered by the closure element, such that the coffee beans in this compartment can be supplied to the grinding mill. Of special advantage in this coffee grinder is that a change of variety is brought about by rotation of the coffee bean container. As a rule, it has a sufficiently large diameter such that even in the presence of coffee beans, pivoting between the closure element and the particular output opening of a compartment can readily take place since due to the large lever, such a coffee bean could readily be pressed to the side. In particular the possibility exists of rotating the coffee bean container with both hands.

Between the closure element and the particular output opening of the compartments of the coffee bean container usefully only a movement gap of minimal width is formed, whose inner width is markedly less than the average diameter of a coffee bean.

The closure element can basically be developed in the manner of a disk emplaced [covering] the upper input opening of the shaft of the grinding mill. In this case the coffee bean container does not include a guide cone, but rather the openings of the

compartments are placed directly into the bottom of the coffee bean container.

However, another embodiment provides that the coffee bean container includes a guide element, for example a guide cone, for the lateral supply of the coffee beans into the output shaft. In this case the closure element is adapted to the bottom-side contour of the guide element and is structured, for example in the form of a cup open downwardly.

Usefully the closure element is detachably held torsion-tight on the grinding mill, so that, after the removal of the coffee bean container and after removing the closure element, the grinding mill is accessible at the top. An embodiment, in which the grinding mill comprises an upper shoulder, on which the closure element rests, is useful. To bring about a rotational decoupling from a rotational movement of the coffee bean container disposed above it, the closure element can carry a radially projecting toe which engages a corresponding recess of the housing of the grinding mill. The coffee bean container usefully carries at the bottom side an encircling collar encompassing the output shaft, which the housing of the grinding mill engages.

An automatic coffee maker equipped with such a coffee grinder consequently can store different coffee varieties. The coffee bean container of such an automatic coffee maker can be moved to the grinding mill in different rotational positions, and it can also be provided that in one position already ground coffee powder can be filled into the brewing chamber of the automatic coffee maker through a lateral supply shaft past the grinding mill.

The compartmentalization of the coffee bean container can be realized through detachable walls, which can be set into corresponding grooves of the coffee bean

container. In such an embodiment it is possible to fill the coffee grinder with only one single coffee bean variety when the partitioning walls are removed.

In the following the invention will be described in conjunction with an embodiment example with reference to the enclosed Figures. Therein depict:

**Fig. 1**                      schematic view of an automatic coffee maker with an integrated coffee grinder,

**Fig. 2**                      schematic section through the coffee grinder of the automatic coffee maker of Figure 1 in the region of the lower termination of the coffee bean container in a first position, and

**Fig. 3**                      the configuration of Figure 2 in a further position of the coffee bean container relative to the grinding mill.

An automatic coffee maker 1 is conceptualized as a fully automatic coffee maker and, in addition to the two visible coffee outlets 2, 3, comprises a steam tube 4, at whose free end a steam nozzle 5 is disposed. The housing 6 of the automatic coffee maker includes a recessed seating 7, into which an operating panel 8 is set. The operating panel 8 comprises several push-buttons T as electric switches, with which the different functions of the automatic coffee maker 1 can be initiated. Several LEDs L serve as control display means for indicating that a specific push button T has been actuated or also as a selection indicator, if several different functions can be executed with one push-button T, as well as for indicating error functions. In the housing 6 of the automatic coffee maker 1 a grinding mill for grinding coffee beans is disposed. For the storage of coffee beans a coffee bean container 9 is associated with the automatic coffee

maker 1, which is connected by means of a coupling ring with the housing 6 of the automatic coffee maker 1. The coffee bean container 9 is placed onto a top-side opening of housing 6, beneath which the grinding mill is positioned.

To the automatic coffee maker 1 is available a coffee grinder 11 formed of the coffee bean container 9 and a grinding mill 10, which is shown partially sectioned in Figure 2. The coffee bean container 9 is divided by a partitioning wall 12 into two compartments 13, 14, such that in the coffee bean container 9 two different coffee bean varieties can be stored. In the lower region of the coffee bean container 9 is located a guide cone 15, which is braced via several webs S on the bottom 16 of the coffee bean container 9. Between the webs S of the guide cone 15 are disposed several output openings, of which in Figure 2 two output openings 17, 18 are evident. The disposition of the webs S and the output openings 17, 18 are conceptualized such that such an output opening 17, 18 terminates either in compartment 13 or compartment 14.

At the bottom 16 of the coffee bean container 9 an encircling collar 19 is formed on, such that it projects downwardly. By the collar 19 and the webs S an output shaft 20 is encompassed. The grinding mill 10 with its housing 21 is disposed such it engages the output shaft 20. The grinding mill 21 is fixedly mounted in the automatic coffee maker 1.

Associated with the grinding mill 10 is a closure element 22, whose formation corresponds to the contour of the underside of the guide cone 15. The closure element 22 in approximation is consequently a segment of a fourth of a sphere. The closure element 22 is set onto a shoulder in the region of the input of the grinding mill 10 and connected via a toe 23 torsion-tight with the grinding mill 10.



The coffee bean container 9 is connected with the housing 6 of the automatic coffee maker 1 through a bayonet locking, of which in Figure 2 are evident two bayonet toes 24, 25 associated with the coffee bean container 9 and one bayonet groove 26 provided as a part of the housing 6. As is evident in Figure 2, the coffee bean container 9 is braced at the underside on the housing 6 of the coffee bean container. The coffee bean container 9 is rotatable about its vertical axis relative to the grinding mill 10 and the remaining components of the automatic coffee maker 9. In the position of the coffee bean container 9 depicted in Figure 2 opposite to the grinding mill 10 the output opening 17 is not closed, such that in this position the coffee beans in compartment 14 impinge on the input of the grinding mill 10, as is indicated in this Figure by the arrow symbolizing the flow of the coffee beans. Coffee beans contained in compartment 13 of the coffee bean container 9 cannot penetrate into the output shaft 20, since the output opening 18 is closed by closure element 22. However, the coffee beans in compartment 13 can be introduced into the output shaft 20 and supplied to the grinding mill 10 if the coffee bean container is rotated by 180° into its other position. This is shown in Figure 3. Since the closure element 22 is rotationally decoupled with respect to the rotational movement of the coffee bean container 9, it remains in its original position. The output opening 18 of compartment 13 subsequently assumes the position in which, in the previously described position of the coffee bean container 9, output opening 17 had been disposed. Consequently, now coffee can be brewed with the automatic coffee maker 1, whose coffee beans are contained in compartment 13 of the coffee bean container 9 and which had been introduced via the output opening 18 of compartment 13 into the output shaft 20 and been supplied to the grinding mill 10.

The front side 27 delimiting the open side of the closure element 22 is usefully beveled and specifically toward the space encompassed by the closure element 22.

The description of the invention makes clear that with the described coffee grinder not only a grinder with simple means for the selection of different coffee varieties has been made available, but also an automatic coffee maker with such coffee grinder. The coffee bean container of such a coffee grinder can also comprise more than two compartments.

The different positions of the coffee bean container with respect to the grinding mill are usefully indicated haptically, for example by catching positions in order to indicate in this way when a user has reached a particular position. The coffee grinder can, in principle, be conceptualized such that a position change of the coffee bean container is detected at the side of the device, and that, after a change-over has occurred, the grinding mill is switched on for a short time in order to remove the remaining beans of the previously selected coffee variety from the grinding mill. The coffee meal produced during the grinding of these residual beans is usefully supplied to a separate container. When using such a coffee grinder as part of an automatic coffee maker, this coffee meal can be transferred into the refuse container for coffee grounds.

### **List of Reference Symbols**

- 1 Coffee maker
- 2 Coffee outlet
- 3 coffee outlet

- 4 Steam tube
- 5 Steam nozzle
- 6 Housing
- 7 Recessed seating
- 8 Operating panel
- 9 Coffee bean container
- 10 Grinding mill
- 11 Coffee grinder
- 12 Partitioning wall
- 13 Compartment
- 14 Compartment
- 15 Guide cone
- 16 Bottom
- 17 Output opening
- 18 Output opening
- 19 Collar
- 20 Output shaft
- 21 Housing
- 22 Closure element
- 23 Toe
- 24 Bayonet toe
- 25 Bayonet toe
- 26 Bayonet groove
- 27 Front side
  
- L LED
- S Web
- T Push-button

### **Patent Claims**

1. Coffee grinder with a coffee bean container (9) divided by forming at least two

compartments (13, 14), with a bottom-side output shaft (20) common to both compartments (13, 14), with a grinding mill (10) disposed beneath the output shaft (20), and with a closure element (22) for the optional closing of the output (17, 18) of at least one compartment (13, 14), **characterized in that** the closure element (22) forms with the grinding mill (10) a concrete matter unit and the coffee bean container (9) is disposed rotatably relative to the unit formed of the closure element (22) and the grinding mill (10).

2. Coffee grinder as claimed in claim 1, **characterized in that** the closure element is developed in the manner of a disk, by which the top-side open input of the grinding mill is partially closed.
3. Coffee grinder as claimed in claim 1, **characterized in that** the coffee bean container (9) comprises a guide element (15) for the lateral supply of coffee beans into the output shaft (20), and the closure element (22) is disposed beneath the guide element (15) and its contour is adapted to the underside of the guide element (15) and the outputs (17, 18) formed by it of the compartments (13, 14).
4. Coffee grinder as claimed in claim 2 or 3, **characterized in that** the closure element (22) is connected form-fittingly relative to the rotatability of the coffee bean container (9) with the grinding mill or its housing (21).
5. Coffee grinder as claimed in claim 4, **characterized in that** the closure element (22) carries a radially projecting toe, which engages a seating of the grinding mill (10) or its housing.
6. Coffee grinder as claimed in one of claims 1 to 5, **characterized in that** the coffee

bean container (9) comprises an encircling collar (19) encompassing the output shaft (20) into which extends the grinding mill (10).

7. Coffee grinder as claimed in one of claims 1 to 6, **characterized in that** the coffee bean container (9) is connected detachably relative to the grinding mill (10) and with it by a bayonet locking.
8. Coffee grinder as claimed in one of claims 1 to 7, **characterized in that** the coffee grinder (10) is a part of an automatic coffee maker (1).
9. Automatic coffee maker with a coffee grinder, comprising a coffee bean container (9) with a bottom-side output shaft (20) and with a grinding mill (10) disposed beneath the output shaft (20), **characterized in that** the coffee bean container (9) is divided by the formation of at least two compartments (13, 14), wherein the compartments (13, 14) of the coffee bean container (9) terminate in the output shaft (20), and that the automatic coffee maker (1) comprises a closure element (22) for the optional closing of the output (17, 18) of at least one compartment (13, 14), wherein the closure element (22) forms with the grinding mill (10) a concrete unit and the coffee bean container (9) is disposed rotatably relative to the unit formed of the closure element (22) and the grinding mill (10).
10. Automatic coffee maker as claimed in claim 9, **characterized in that** the closure element is developed in the manner of a disk which partially closes the upper open input of the grinding mill.
11. Automatic coffee maker as claimed in claim 9, **characterized in that** the coffee bean container (9) comprises a guide element (15) for the lateral supply of coffee beans into the output shaft (20) and the closure element (22) is disposed beneath

the guide element (15) and its contour is adapted to the underside of the guide element (15) and the outputs (17, 18) of the compartments (13, 14) formed by it.

12. Automatic coffee maker as claimed in claim 9 or 10, **characterized in that** the closure element (22) is connected form-fittingly relative to the rotatability of the coffee bean container (9) with the grinding mill (10) or its housing (21).
13. Automatic coffee maker as claimed in claim 12, **characterized in that** the closure element (22) carries a radially projecting toe (23), which engages a seating of the grinding mill (10) or its housing (21).
14. Automatic coffee maker as claimed in one of claims 9 to 13, **characterized in that** the coffee bean container (9) comprises an encircling collar (19) compassing the output shaft (20), into which extends the grinding mill (10).
15. Automatic coffee maker as claimed in one of claims 9 to 14, **characterized in that** the coffee bean container for its partitioning into the at least two compartments comprises a wall, which can be removed from the coffee bean container.
16. Automatic coffee maker as claimed in one of claims 9 to 15, **characterized in that** the coffee bean container (9) is connected detachably relative to the grinding mill (10) and with it through a bayonet locking.

## **Abstract**

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A coffee grinder with a coffee bean container 9 divided into at least two compartments 13, 14, with a bottom-side output shaft 20 common to both compartments 13, 14, with a grinding mill 10 disposed beneath the output shaft 20 and with a closure element 22 for the optional closing of the output 17, 18 of the at least one compartment 13, 14, is characterized thereby that the closure element 22 forms with the grinding mill 10 a concrete unit and the coffee bean container 9 is disposed rotatably relative to the unit formed of the closure element 22 and the grinding mill 10.

The invention further relates to an automatic coffee maker with a coffee grinder with such a coffee bean container 9.